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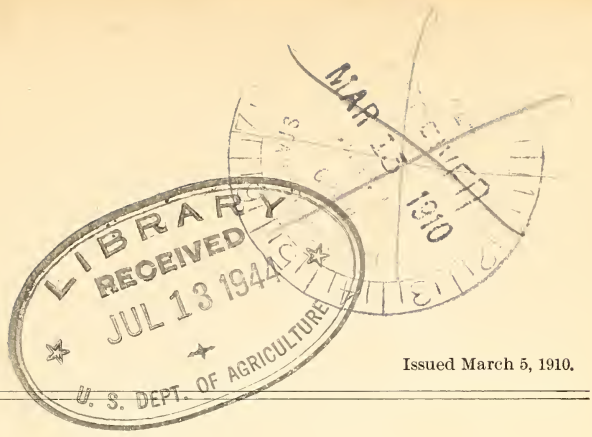

Issued March 5, 1910.

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF PLANT INDUSTRY—Circular No. 50.

B. T. GALLOWAY, Chief of Bureau.

THREE MUCH-MISREPRESENTED SORGHUMS.

BY

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BUREAU OF PLANT INDUSTRY.

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[Cir. 50]

B. P. I.—545.

THREE MUCH-MISREPRESENTED SORGHUMS.[a]

SHALLU ("CALIFORNIA WHEAT").

The following extracts are from letters received on November 4 and 8, 1909, respectively, from a well-known seed firm. They indicate that attempts are being made to sell seed of shallu, a variety of sorghum, at exorbitant prices, by unwarranted claims of enormous yields.

We inclose a sample of grain which an Oklahoma man is selling under the name of "California wheat," at 50 cents a pound. He claims it will produce from 200 to 400 bushels per acre. * * * We corresponded with him and bought a pound of the seed to investigate. We have it over his own signature that this grain will produce from 200 to 400 bushels per acre. He sells the seed at 50 cents a pound, or 40 cents in 100-pound lots. Of course, the grower may be sincere in thinking that he has a wonderful new grain, but we think the public ought to be guarded against the repetition of the Alaska wheat excitement of last year.

HISTORY OF THE VARIETY.

The writer has had this variety under experimental cultivation since the season of 1905. It has been grown at different stations in the Great Plains area and also at the Arlington Experimental Farm, near Washington, D. C., under Agrostology No. 2650 and Grain Investigations Nos. 85, 100, 125, and 165. It has also been tested by a few of the state agricultural experiment stations, particularly Louisiana, Oklahoma, and Kansas. Its known history in this country may be related briefly.

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[a] Numerous varieties of sorghums have been brought to this country during the past hundred years for use as forage, grain, or sugar crops. Many such importations are soon discarded from general cultivation as being inferior, unsatisfactory sorts, but remain in limited use in scattered localities. From time to time these localized crops are discovered anew by persons unacquainted with their history and habits and are brought to public notice as wonderfully desirable varieties. Sometimes they occasion little more trouble than a burdensome correspondence on the part of those handling such crops. In other instances they are exploited for profit by individuals whose statements are misleading, though often made without such intention. The great need for profitable drought-resistant crops in the dry regions of the West leads many farmers to invest in such over-advertised seeds. This paper gives the known facts concerning three varieties of sorghum about which much confusion of ideas exists and some misleading statements are being made.—B. T. Galloway, *Chief of Bureau.*

It was imported directly from India by officers of the Louisiana State Experiment Station, about 1890. By them it was known as "Egyptian wheat," and was found to be an inferior variety of sorghum, as the following quotations will show.

Recently introduced; stalk small; panicle open and spreading; not equal to other kinds given here.[a]

Low growing, inferior kind, nonsaccharine. Has seeds in open panicle. Inferior to yellow and white milo and kafir corn; should not be used with expectation of best results.[b]

We grew it for many years at all three stations and abandoned it as inferior for forage to other sorghums. "Egyptian wheat" was imported directly from India by us and corresponds to your description of shallu. Our farm managers well recognize it from your description.[c]

Though discarded by the Louisiana station, small lots of the seed had been taken from time to time by visitors. In this way the variety was carried to other localities, principally westward into Texas and Oklahoma. Early in 1905 it came to the writer's attention in Texas, under the name "California wheat." Through field investigation and the aid of agricultural papers it was found growing at scattered points in Oklahoma and Texas. Many names, mostly somewhat misleading, have been applied to it in the past five years. Among them are "California Rice corn," "California wheat," "Chicken corn," "Chinese Golden sorghum," "Egyptian rice," "Egyptian wheat," "Mexican wheat," and "Rice corn."

RELATIONSHIPS AND DESCRIPTION.

Shallu belongs to a group of sorghums entirely distinct from any of the other groups grown in this country. Botanically, it belongs to the variety *roxburghii* Hackel. This variety is found commonly in some parts of India and also in Africa, especially in the Sudan and in central East Africa. It seems to be the leading variety in the island of Madagascar. Recent importations are represented by Seed and Plant Introduction Nos. 16856 and 18192 from German East Africa, 23422 from Natal, 23714 to 23716 from Portuguese East Africa, and 24339 and 24340 from the Transvaal. Other recent numbers belong probably to this variety, but the plants have not matured, and this fact can not be certainly determined from the seed alone.

As found in Africa and India the group possesses the following characters. The stems are tall and slender, 6 to 12 feet in height. They stool freely, producing a large number of suckers. The pith is neither juicy nor sweet, but dry. The heads or panicles (fig. 1) are

[a] Bulletin 19, second series, Louisiana State Experiment Stations, 1892, p. 538.

[b] Bulletin 53, Louisiana State Agricultural Experiment Station, 1898, p. 12.

[c] Dr. W. C. Stubbs (formerly director of the Louisiana State Experiment Stations), in a letter to the writer, March 27, 1906.

large and loose, usually conical, that is, broad at the base and pointed at the top, like those of typical Early Amber sorgo. The long and slender branches of the head are spreading and drooping at the tips. This group, comprising the variety *roxburghii*, is separated easily from all other groups of sorghums by the shape and position of the glumes at maturity. The two glumes, or hulls, are broadly lanceolate or ovate in shape and closely surround the young seed, as in all sorghums. As the seed ripens, however, these glumes gradually

FIG. 1.—Two heads of shallu. (One-fourth natural size.)

open or spread widely apart, completely exposing the seed. At the same time the edges of each glume begin to curl inward and become quite involute. In different varieties the glumes vary from pale yellow to black and the seeds from white to buff, pale red, and reddish brown.

Only one variety is found in this country. It grows from 5 to 8 feet high, according to elevation, soil, and moisture. It produces from 2 to 5 suckers. The stems bear from 11 to 15 leaves of medium size, 13 being the average number. The heads are of the shape

described above, 8 to 15 inches long, and of a pale-yellow color. The glumes are a pale-straw color and the oval seeds whitish to pale buff and about the size of the kafir seed.

CROP CHARACTERS AND PROBABLE VALUE.

Strong claims are being made for shallu by some of those who are growing it. Five ways are commonly stated in which the growers believe it excels all other sorghums. These are (1) in drought resistance, (2) in yields of seed to the acre, (3) in the feeding value of the grain, (4) in the tonnage of fodder produced, and (5) in the feeding value of this fodder. These five claims may be discussed in their order.

(1) *Drought resistance.*—Little is known concerning the absolute drought resistance of shallu. In just what characters drought resistance resides is an open question. Statements as to the relative resistance of different varieties must always take account of the stand of plants, as well as of differences in the soil, in the fertility, and in the water content of the plats or fields. Experiments so far do not indicate that shallu is more drought resistant than other sorghums. In unfavorable seasons it suffers in the same way and in the same proportion, apparently, as do other grain sorghums; that is, on many stalks the heads fail to push completely out of the boot, or upper leaf sheath.

(2) *Yields of grain.*—Farmers growing this crop for the first time commonly estimate that their fields will yield from 75 to 100 bushels to the acre. They are misled by the large size of the heads in comparison with those of milos and kafirs. The heads of shallu are, however, loose and open and usually do not weigh as much as those of the other grain sorghums. Besides this, the shallu heads do not contain as high a percentage of seed in proportion to the weight of the head as do the other grain sorghums.

The advertiser mentioned in the extracts at the beginning of this circular claims a yield of 200 to 400 bushels to the acre. Such claims are simply preposterous. The best of the grain-producing sorghums rarely exceed a yield of 50 bushels to the acre. Their average yields in favorable seasons lie somewhere between 35 and 40 bushels to the acre. In unfavorable seasons the yields are, of course, much lower. The average yields of milos and kafirs for all seasons in any ten-year period are not likely to be much above 30 bushels. There is yet no evidence that the average yields of shallu will exceed those of such crops as the milos and kafirs.

At the experimental farms of the Office of Grain Investigations of the Bureau of Plant Industry comparatively low yields of grain have been secured in the experiments with shallu. In the year 1906, which was a very favorable season for grain sorghums in the Pan-

handle region of Texas, 2 plats at the Channing Experimental Farm yielded at the rate of 19½ bushels to the acre. On the same farm milo yielded as high as 46 bushels, Blackhull kafir 35, and Red kafir 47. In 1906 the yield of shallu at the Amarillo Experimental Farm, from seed grown in that vicinity, was only 25.2 bushels. At the same time Blackhull kafir yielded from 43 to 54 bushels and a plat of Red kafir, 45.9. Most of the milo was destroyed by hail. In the years succeeding 1906, shallu has never done quite as well in comparison with the other grain sorghums as it did in that year.

A considerable correspondence with farmers who are raising this crop has brought to light only one high yield in which actual weighing or measuring of the thrashed grain is claimed. This yield is said to have been 60 bushels to the acre, figured at 56 pounds to the bushel. It was secured in the favorable season of 1908, in the southern part of the Plains region, where the season is comparatively long and the elevation less than 2,000 feet.

(3) *Feeding value of the grain.*—No experiments in feeding shallu grain have been made by any of the state agricultural experiment stations, so far as known. Other grain sorghums are known to have a feeding value about 90 per cent as great as that of corn. It is with them that shallu must be compared. The chemical analysis of shallu does not indicate a different composition in any particular. One grower has published the statement that as a feed for milch cows he finds shallu superior to cottonseed in the production of milk and butter. This opinion is no doubt honestly entertained, but such a general statement is likely to lead many to believe that the starchy grain sorghums, rich in carbohydrates, can be used as feeding substitutes for bran, cottonseed, and other products rich in protein. This, of course, is not the case.

(4) *Yields of forage.*[a]—From the forage standpoint shallu does not make any better showing. At the Channing farm in 1906, the 2 grain plats yielded an average of 3,227 pounds of forage to the acre, including the weight of the seed. On the same farm, the 12 grain plats of milo averaged about 4,800 pounds of forage, the 5 plats of Blackhull kafir about 6,300 pounds, while 1 plat of Red kafir yielded 7,800 pounds to the acre. On the Amarillo Experimental Farm in the same season, the grain plat of shallu yielded at the rate of 7,100 pounds of fodder to the acre, including the seed. In comparison, 6 grain plats of milo averaged 9,000 pounds of fodder to the acre, and 17 grain plats of Blackhull kafir and 6 grain plats of Red kafir averaged over 10,000 pounds each to the acre. In the plats grown

[a] The forage plats of sorghums on the Amarillo Experimental Farm were maintained by the Office of Forage-Plant Investigations of the Bureau of Plant Industry. Mr. C. V. Piper, agrostologist in charge, agrees in the conclusions drawn regarding the forage value of shallu, and the figures presented in this connection.

especially for forage, Blackhull kafir averaged over 12,000 pounds, Red kafir over 13,000 pounds, and the two best sorgos,[a] or sweet sorghums, over 15,000 and 17,000 pounds to the acre, respectively.

(5) *Value of the forage.*—There is also no reason for believing that the quality of the forage is better than that produced by kafirs and sorgos. The stems are dry and pithy, like those of corn, milos, and the kowliangs. The kafirs have somewhat juicy stems, while the sorgos are both juicy and sweet. The average number of leaves to the stalk is very close to 13, which is slightly lower than the average for kafirs and all sorgo varieties except the Amber group. These facts concerning the dry stalks, the ordinary number of leaves, and the comparatively low tonnage of forage do not indicate a variety of high forage value, either in quantity or quality.

OBJECTIONABLE CHARACTERS IN SHALLU.

While growing shallu on a small scale in 1905 and more extensively in 1906, some serious faults were found in it. The four most prominent of these are stooling, lodging, retaining the base of the head in the boot, and shattering. Experiments with shallu in recent years have been largely directed toward getting rid of these undesirable characters.

Stooling, or producing suckers at the base of the main stalk, is not desirable in grain sorghum, however it may be regarded in forage varieties or in small grains generally. The heads borne on suckers are always later in maturing than those on the main stalk. Moreover the suckers are not usually of the same height as the main stalks. This lack of uniformity in ripening and in height causes difficulty in harvesting the grain, especially with any type of header. While a smaller quantity of seed may be required in sowing a freely stooling variety, so little seed is used for any of the grain sorghums that this small saving is not worth considering.

Its habit of lodging is one of the most serious objections to shallu. Just at the time when the heads are heavy with the green seeds the stalks begin to lodge. In the writer's experiments it has happened more than once that by the time one-tenth of the heads were ripe fully one-fourth of the stalks were down in a hopeless tangle.

The failure of the heads to come completely out of the boot is often a serious matter to the grain grower. On a considerable proportion of the stalks the base of the head remains inclosed by the sheath, even in favorable seasons. No seed is produced on this included portion, and the yield is reduced to that extent. This basal part of the head also becomes infested with plant lice and worms and usually becomes

[a] Sorgo is the name which has been adopted for the group called variously sweet, saccharine, or sirup sorghums, and commonly, but erroneously, "sugar cane."

moldy and rotten. At thrashing time this moldy material is scattered through the good seed and causes further loss.

There has also been trouble with the shattering of the seed. This results especially where the crop is allowed to stand in the field until past fully ripe. It also occurs where the crop is cut when ripe and allowed to remain in the shock through the fall. When these shocks are taken up for thrashing or feeding, the seed shatters very readily and much is lost in spite of careful handling.

CONCLUSION.

It is not claimed that shallu is without value for the sorghum-growing regions. Its alleged superiority to other well-known and quite satisfactory varieties has not been proved, however. On the contrary, there is strong evidence that it is somewhat inferior to milos and kafirs. In any case it should be tried only on a small scale at first. For grain production a seeding of 2 to 4 pounds to the acre will be quite sufficient, the quantity varying with the soil, elevation, and latitude. There is no reason whatever for paying an exorbitant price for the seed in either large or small quantities.

The following statement by Prof. A. M. Ten Eyck, of the Kansas Agricultural Experiment Station, published recently in the Kansas Farmer, is to the point:

> The tests of the crop at this station indicate that it is not so valuable as sorghum or kafir corn either for fodder or for seed. The yields of the grain have been less than the yields of kafir corn, and the crop is objectionable because the stems are usually very slender and the crop lodges badly and is hard to harvest. In my judgment seedsmen are selling it at a high price simply because it is a novelty or not well known.

SUMMARY.

Shallu is a variety of sorghum first introduced about 1890 by the Louisiana State Experiment Station, and soon discarded.

It has lately reappeared under such misleading names as "California wheat," "Egyptian wheat," and several others.

Shallu belongs to a group of sorghums quite distinct from the other groups grown in this country.

It is easily distinguished by the loose conical panicle with slender, drooping branches and the lanceolate glumes which spread wide apart and become inrolled at maturity, completely exposing the oval seed.

Shallu is claimed by some to be superior to all other sorghums in drought resistance, yield and value of the grain, and tonnage and quality of the forage. These statements are misleading.

It is now being advertised and sold at exorbitant prices as a drought-resistant variety capable of yielding 200 to 400 bushels of grain to the acre. Such claims are absurd.

Experiments conducted by the writer and by the Office of Forage-Crop Investigations, as well as the observations of numerous farmers, indicate that shallu is rather inferior to milo and kafir varieties as a grain crop and to kafirs and sorgos as a forage crop.

Those who purpose growing it are advised to do so on a small scale and not to pay exorbitant prices for the seed.

All farmers who test shallu in the season of 1910 are requested to report their results to the writer of this paper. Report sheets and envelopes for this purpose will be furnished to all who request them.

"CHOCOLATE CORN."

In October, 1905, the brief letter reprinted below was published in one of the daily papers of the eastern United States.

> In your department "H. H." asks for information concerning what she or he calls "chocolate corn." Quite a number of years ago Isaac Newton, first Commissioner of Agriculture under James Buchanan, sent my father a pint of chocolate corn, requesting him to plant it and report the results to the Department. It resembled broom corn very closely—only darker and ranker. In color it was a dark brown. I suppose the crop of seed, which was thrashed out with a flail on the barn floor, was twenty times greater than broom corn; I think the crop yielded fully 200 barrels to the acre. Everything to which it was fed ate ravenously, gaining in flesh rapidly. For fattening purposes I never saw its equal.
>
> Horses and cattle would eat every particle of the stalk after it had been thrashed. The stalk grew to a great height.
>
> I remember we ground some of it in the coffee mill and used it as a beverage at the table. It was fairly good, but not as clear as the prepared chocolate which comes in cakes.
>
> I never heard it called "chocolate corn," nor did it resemble popcorn in the least. There was no ear or husk—just the seed growing on the tassel, which was literally covered.
>
> I think it can be obtained at the Agricultural Department in Washington. It is a wonder that poultry raisers do not cultivate it. I presume its value as an article of diet for all kinds of poultry can not be equaled.
>
> ———— M. D.

Some of the statements made in this letter naturally attracted attention in many quarters. This was especially true of those statements concerning the yield of the grain, its feeding value, its use as a beverage, and the source of the seed. It scarcely need be said that the estimates of the yield and feeding value are greatly exaggerated.

The letter just quoted was rather widely copied by newspapers and periodicals of all classes. The result was a flood of letters directed to the Department of Agriculture, asking for seed and information. All such inquirers were answered and given the known facts. Apparently the same letter has been republished recently, and the matter of "chocolate corn" is being agitated anew. The following statement has therefore been prepared for the information of those interested:

(1) The Department of Agriculture has for distribution no seed of any plant called "chocolate corn."

(2) The plant once known and used under that name was some one of the many varieties of sorghum.

(3) From the brief descriptions given by different writers it is certain that the variety was very similar to the Early Amber sorgo[a] of to-day.

The writer of the letter quoted does not say under what name the seed was sent to his father. He does state, however, that he never heard it called "chocolate corn." So far as recorded, the only sorghum seed distributed by the United States Patent Office during President Buchanan's administration was that of the Chinese sorgo. This was sent to a very few selected persons in 1855, and 175 bushels of mostly home-grown seed were distributed in 1857. It was undoubtedly this Chinese sorgo which the correspondent recalls. The description quoted tallies very well, as far as it goes, with the Chinese sorgo. It was very similar to our Early Amber sorgo. In fact, the Amber sorgo varieties are supposed by many to have been derived by selection from the Chinese sorgo.

It is interesting to know, however, that a sorghum variety called "chocolate corn," and used as a beverage, was known at a much earlier date. The following quotation from a paper[b] on *Sorghum saccharatum*, or Chinese sorgo, written in 1857, is sufficient to indicate the use of such a variety about 1830:

> It is by some supposed to have been cultivated to a limited extent in western Pennsylvania, eastern Ohio, and perhaps in other localities, twenty-five or thirty years since, for the seed or grain, which was then used, in some instances, as an article of food by farmers who experimented in its cultivation. There were at the time mentioned two varieties cultivated, one having black panicles under the name "*chocolate*," and the other, having white panicles, was called "rice." The "chocolate" or black variety was prepared for use by browning the seeds, still contained in the panicles, in the manner of coffee, and then making a coffee, which, with the addition of cream and sugar, resembled chocolate in appearance and somewhat also in taste, and was quite palatable.

Since the Chinese sorgo was not known to Europe until 1851, and to this country until 1853, it could not have been the "chocolate corn" of 1830. But a black-panicled variety was introduced to Europe in the first century A. D., and was known to many European herbalists of the sixteenth and seventeenth centuries. It was grown and described in Italy by Arduino in 1786. That it was imported to the United States is the natural conclusion. Johnson grass was brought from the Mediterranean region about 1830.

Most descriptions refer to this sorghum and to the Chinese sorgo as having black seeds. No sorghums having black seeds are known.

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[a] Sorgo is the name adopted for the sweet or saccharine group of sorghums, often erroneously called "sugar cane."

[b] John H. Klippart, corresponding secretary, Ohio State Board of Agriculture. Report, 1857, p. 409.

The Chinese sorgo and the Early and Minnesota Ambers have shining black glumes, which closely surround the reddish-brown seed and often remain attached after thrashing. In such cases the spikelet is often described instead of the seed.

Nothing is known of the nutritive value of the seeds of this and other sorghums in the preparation of household substitutes for coffee, chocolate, etc. Some of the grain sorghums may be found to have value as the basis of new cereal drinks comparable to those now made from wheat preparations. Tannin is present in larger or smaller quantities in the seed coats of all the brown and reddish-brown seeds. There are, however, white-seeded varieties of kafir, kowliang, and milo.

SUMMARY.

Attention has been recently called to a crop under the name of "chocolate corn" by a widely copied newspaper paragraph.

The statements regarding its high yields of grain, its use as a substitute for chocolate, and the possibility of securing seed from this Department have caused a great deal of correspondence.

The Department has no seed of any crop known as "chocolate corn" for distribution. The plant mentioned was a sorghum variety.

Some variety of sorghum was cultivated in this country under the name of "chocolate corn" as early as about 1830 and, sparingly, for some time thereafter. It was probably similar to Amber sorgo.

The value of the seeds of the various sorghums in the preparation of a beverage is not known. It may be possible to use them for this purpose, as other grains are used in preparing cereal drinks.

GOOSENECK SORGO ("TEXAS SEEDED RIBBON CANE").

There exists among farmers and seedsmen at the present time a great deal of confusion concerning the plant known as Gooseneck sorgo, and also passing under other names. The trouble has been largely caused by the use of the name "Seeded Ribbon cane" for a sorghum. A brief statement of facts gathered during the past five years may serve to make the matter clear.

In order to understand how the use of this name has caused trouble, the following preliminary facts must be kept in mind: (1) The true sugar cane (*Saccharum officinarum*) is commonly known as "Ribbon cane" in the Gulf States where it is grown. (2) It does not produce seed in this country, and fields are always started by planting the stalks, which is a comparatively laborious and expensive process. (3) Sugar planters would eagerly welcome a true sugar cane which could be grown from seed. (4) Sugar cane requires a subtropical climate, and therefore can not be grown very far from the Gulf States.

Beginning about six years ago, a plant was much advertised and its seeds widely sold at high prices under the name of "Texas Seeded Ribbon cane." It was claimed to be a form of true sugar cane which not only produced seed, but could be grown true from seed, thus doing away with the labor of preserving and planting the stalks.

It was said to grow successfully as far north as northern Oklahoma and Arkansas. It was further claimed that the United States Department of Agriculture had pronounced it a true sugar cane. This last statement was, of course, promptly denied.

Brief investigation showed that the plant was a sorghum and the first season's trials identified it as the Gooseneck sorgo (fig. 2). This was probably one of the African imphees obtained in Natal by Leonard Wray in 1851 and introduced to Europe in 1854 and to the United States in 1857. It was a well-known variety during the days when sorgos were grown for sugar purposes, but had largely disappeared from cultivation after those experiments were discontinued.[a]

FIG. 2.—A head of Gooseneck sorgo. (One-third natural size.)

As soon as these facts were learned a brief statement was given to the agricultural press and a great many inquirers informed by letter. In the mean time, many farmers who had purchased and planted seed recognized the crop as the old Gooseneck sorgo. They reported their belief both to this Department and to their agricultural papers. However, the sale of seed as that of a true sugar cane was continued under the impetus of skillful advertising. The warnings of the farmers first humbugged seemed without effect.

At the close of the second season a new complication appeared. Many farmers reported that their crop, while clearly a sorghum, was not the Gooseneck variety but some other. An examination of many samples submitted for identification showed that Sumac, Orange, and Planter sorgos, all varieties with erect heads, were being grown under the name of "Seeded Ribbon cane."

[a] At the present time it is known to be of great value as a sirup and fodder crop for the Southern States.

From these facts it was a natural inference that, when their available supply of the seed of Gooseneck sorgo was exhausted, growers and dealers had substituted the seed of these other sorgo varieties rather than lose sales at very profitable prices. When attention was called to these facts the buying public was assured by some of the growers and dealers that there were two strains of "Seeded Ribbon cane," one "Gooseneck" and the other "Straightneck," and the substitution was continued. Recently a fourth variety, having erect heads, has been offered by a grower as "Straightneck Seeded Ribbon cane." This time it is the Sapling sorgo, once well known under the name "Link's Hybrid."

It is gratifying to note that the leading seed firms handling sorghum seeds in the Southwest, while still using the name "Seeded Ribbon cane," use also the correct name, "Gooseneck sorgo," as an additional title in describing this crop. This is helping much to clear up the matter in the mind of the public. It will be still better when the misleading name "Seeded Ribbon cane" is dropped entirely and this variety sold under its true name, "Gooseneck sorgo," alone. It is to be hoped also that the advertising and sale of other old and well-known sorgo varieties, as "Straightneck Seeded Ribbon cane," will be stopped.

SUMMARY.

True sugar cane (*Saccharum officinarum*) is commonly known as "Ribbon cane." In the past few years a variety of sorgo has been widely advertised and sold as "Texas Seeded Ribbon cane."

It was at first claimed that this was a true sugar cane (Ribbon cane) which could be grown from seed and cultivated much farther north than other forms of sugar cane.

Investigation showed that the plant was the once well-known Gooseneck sorgo, a true sorghum, and this fact was made known by publication and through correspondence.

The seed continued, however, to be advertised and widely sold at high prices, and when the supply ran short seeds of other sorgo varieties, having erect heads, were substituted for the Gooseneck sorgo.

Complaining growers were then assured that there were two strains of "Seeded Ribbon cane," one "Gooseneck" and the other "Straightneck." The sorgo varieties thus sold were Sumac, Orange, and Planter. Recently a fourth, Sapling sorgo, has been offered by a grower as "Straightneck Seeded Ribbon cane."

During the past two years leading seed firms in the Southwest have been explaining that the plant offered as "Seeded Ribbon cane" is Gooseneck sorgo.

Approved:

JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., *January 8, 1910.*

[Cir. 50]